

Arremonops, Mar 20, 1958, II

(2)

Most of these birds appear to be mated, and it is significant therefore, that singing is very rare. Certainly none of the mated birds seem to sing when the ♀ is nearby.

I can add 2 new patterns to the repertoire of the species.

One is series of "Whaa whaa whaa ..." or "Waaah waaah waaah ..." Notes, which is, I think, a form of "HAC" or Wh Notes. I shall call this HAC for the time being at least. The notes are both throat and nasal. Sometimes, perhaps usually, uttered comme ça — — — I first heard this yesterday when there seemed to be a fight in the shrubbery somewhere (One of the birds then flew out of a bush and landed on the ground and uttered "chuck" Notes — see below). I have since heard it quite a number of times in various circumstances (usually when it was quite impossible to see the birds themselves).

It is apparently given when (ever?) one bird of a mated pair joins another — without actual fighting or "chuck Notes" in some cases — although it may follow "chuck Notes" when

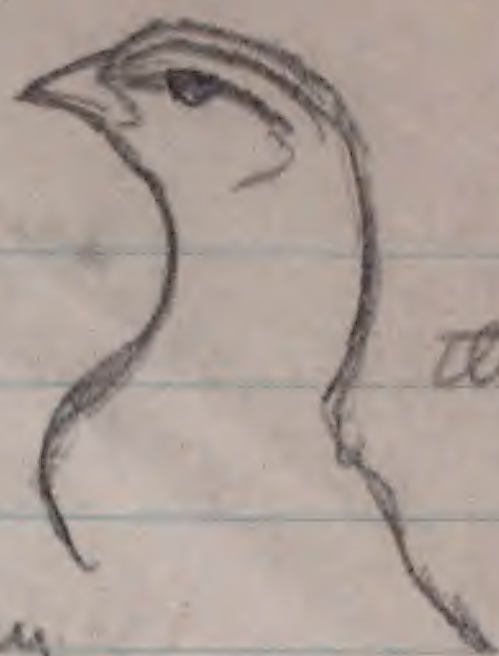
latter are apparently used to bring the members of a pair together — see below. I would have said that this "HAC" was definitely hostile, probably aggressive; but this association with "greetings" between mates should make me a little cautious. I have also heard both birds of a mated pair give this HAC as an apparent response to HAC by a third bird a few yards away.

The "chuck" Notes (chk) are even more difficult to understand. As mentioned above, I first heard them uttered by a bird after an apparent fight. The bird landed on the ground and

Anemoneops, May 20, 1958, III

(3)

stood in a posture common during their chik's.
This posture itself would suggest alarm, but I
think that it was probably just simple flight int. mov. —
and certainly the birds do not give chik's when
they fly off alarmed by me.



think

I have also heard chik's, apparently exactly the same
chik's, given as a means of bringing mated birds together. I.E. one
bird will start uttering chik's and the second will start answer-
ing. Each bird gives one chik N, the other responds by a single chik N,
the first gives another single note, the second gives another single
note, etc. etc. Sometimes this alternation is quite regular, some-
times irregular. One often hears that one of the calling birds is
moving slowly through the underbrush toward the other, or that they
are both moving toward one another.

Anemoneops, I

March 21, 1958

K-6

Arrived a little earlier today, just at dawn, and heard a
lot of "singing". But all by unmated birds or mated birds
separated from their mates, as usual. I was more & more im-
pressed with the unmistakable fact that their songs are really
nothing more than bursts of accelerated CN's. I.E. they are
really comparable to the R's, rather than the WS's, of the
tanager. I think I shall call them R's also.

There was another burst of HAC when a third bird came
too close to the members of a pair.

Arremonops, I.

(4)

April 7, 1958
Frijoles

A pair of these birds around in the neighborhood, not doing much, but I did notice a few things.

The "HAC" Notes can't be very aggressive. Both birds of the pair gave these notes whenever one focused the other. Given in flight by a landing bird. Given by the bird on the ground toward the landing bird. Given by both birds on ground after one has landed. On the ground, given from an apparently unritualized more or less erect posture (less extreme than the one shown on Mar. 20, p. 3). This vocal pattern might better be called HCN.

Neither of the birds ever gave "Chuck" Notes when flying away from me.

One of the birds gave a rather plaintive sounding "Whee-oo" Note when it became separated from its mate. "Calling in" the mate? I think so. (This note may have been quite closely related to the "Whit" Notes which introduce the "song".)

Arremonops, I

April 12, 1958
Barro Colorado

I caught one of these birds in my net near C-21 on Apr. 9, and let it loose in the large aviary Apr. 10.

When I pulled it up in the net, it uttered HScr Notes, more or less like those of tanagers, although rather weaker than those of a tanager of comparable size. (These HScr Notes were

Arremonops, Apr 12, 1958, II

(5)

rather similar to the "HAC" Notes, but rather different in rhythm. More "urgent" sounding, in a less organized rhythm, and probably less nasal sounding.)

When I let the bird loose in the aviary, it scuttled into the ground vegetation, and it has just begun to emerge (still for very brief periods) today.

Arremonops, I

April 19, 1958

Barro Colorado

The capture bird has only begun to emerge a little during the last few days, and it is still only coming out for very short periods at rather rare intervals. This is certainly the most "thicket-loving" of all the species I am studying.

I might mention that it seems to have WF's and TT's of the "typical" *Thraupis* or *embervini* type.

Arremonops, I

July 4th, 1958

Pedro Miguel Lalue

I have just caught another Green-back. Obviously a member of a pair which has been hanging about the area for a long time. I then put it in a small cage right beside the net. It's mate has made no attempt to join it; and, perhaps more surprising, neither bird has called the other. This "lack of behavior" also occurred when I caught other Green-backs earlier, and it seems to be characteristic of the species as a whole. This may be correlated with the fact that the species is almost completely non-gregarious.

Memoranda, July 4, 1958, II

(2)

I watched an obviously hostile chase, with a vigorous aerial ruffle, involving 2 birds. Accompanied by lots of very harsh HAC Notes. These were probably harsher than most HAC Notes given when one bird of a pair joins the other. So it may be better to restrict the term "HAC" to the very harsh notes, and call the "greeting" HAC's "GHAC". But there is still no reason to doubt that the GHAC's contain a strong hostile element.

Memoranda, I

July 16, 1958,
Barro Colorado

There has been a pair of wild Green-backed Sparrows around the aviary in which my captive birds are for about 3 days ago. Obviously mates.

Constantly flying to the aviary, together, landing, then flying off to another nearby perch, then to a second, then back to the first, then to a third, etc. etc. etc. Almost always flying together, although one bird may be definitely in the lead.

Whenever they land together, or one bird joins another, there is always a burst of GHAC Notes. Some of these may have been directed toward the captive birds, but I think that most of them were at least solicited by the wild birds upon each other.

As proof of the hostile nature of GHAC Notes, I should mention that one of the wild mates (the ♂?) followed a burst of GHAC by pecking at his mate!!

None of these birds have shown any trace of the R "song".

Arenonops, July 16, 1958, II.

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Which may be taken as an indication that the R of this species is probably not hostile.

The only other call the visitors have given is the 2-syllable "Whit-Chu" described on March 11, p. 1. One (at least) of the visitors (the ♂?) has done quite a lot of this. Which might be taken to indicate that the "Whit-Chu" is more aggressive than the R.

One of the visitors has several times, apparently at random in the midst of his other behavior, suddenly done some fantastically fast tail-quivering (TQu) of some sort. So fast that it is just a blur - I can't tell if it is vertical or horizontal or both. Accompanied by jarring. (This species jags its tail a lot anyhow.) So spectacular that I suspect it must have some sort of sexual significance.

Arenonops, I

August 24, 1958
Cerro Campana

These birds seem to be common in the scrub and forests at all levels of the mountain.

I flushed an apparent pair from the ground at the edge of an isolated copse. They behaved rather as if they had a nest, hopping back and forth nervously near me, apparently reluctant to leave the neighborhood - although I couldn't actually find the nest. One bird was quite vocal, uttering two types of notes - and lots of them. Single chks's, and much weaker, thinner single "Tsep".

Memoranda, Aug 24, 1958, I

(8)

Notes. I think that the latter must have been produced by a relatively stronger escape component than the former. The bird tended to give "Tup"s while moving away from me and "Chucks" while moving toward me.

Memoranda, I

September 8, 1958
Barro Colorado

I got another Green-back from Becequia yesterday, and let it in the cage with the others. They both attacked it vigorously at first, at different times.

Some of these attacks were preceded or accompanied by G by the attacker.

Finally, the new bird just sat on a branch, in a more or less hunched posture, with head quite far down, slanting diagonally, and bill opening from time to time in a pronounced G, and let one of the old birds peck it again on the back.

All this hostility quite silent! Not a sound uttered at any time by any of the three birds.

Memoranda, I

July 7, 1959
Frijoles

I have been making a few casual observations of Green-backed Sparrows here from time to time, in the intervals of observing other species. Nothing very much new.

Anemoneops, July 7, 1959, I.

(9)

Watching some apparently single birds, probably ♂'s separated from their mates, singing in the early morning. One male, at least, gave sort of an abbreviated song, a few introductory notes followed by a few notes which were probably an abbreviated "intention movement" of the complete song, repeated before "warming up" enough to give a complete song. Such abbreviated performances might be represented by the following diagram:

Some ♂'s also gave mixed "jumbles" of a few notes, more or less random arrangements of high and low notes, in the early morning before warming up.

All this is quite reminiscent of the Saltators (see today's notes on Saltator)

Anemoneops, I

April 18, 1960

Barro Colorado

One of the captive birds I have had a long time (ruffed White) has been alone in its cage for several months. But this morning we discovered that she had built a nest and laid an egg already. So we hurriedly tried to provide a mate.

I put 2 new birds in White's cage: one ruffed Green, and the other ruffed Lavender. Lavender did nothing during the first couple of hours after being put in the cage; so I took it out.

Green and White reacted madly to one another, however.

Their reactions to one another can be briefly summarized as follows. White began soliciting immediately, as soon as Green & Lavender were introduced. Green responded immediately by "pouncing" and/or performing a sup-

Memoranda, Apr. 18, 1960, II

(10)

Caunting attacks on White. White always escaped immediately, and sometimes waited a few seconds before resuming soliciting. Sometimes Green followed White immediately after pouncing upon her or supplanting her - sometimes not. In any case, White always resumed soliciting (at first) within at least a few seconds; Green responded by pouncing upon or supplanting her again, etc. etc. etc. They continued like this, with hardly a break, for at least an hour. Then they gradually began to relax. White performed fewer and fewer bouts of soliciting, and Green began to supplant her less and less frequently (and less and less vigorously). Eventually both birds were spending most of their time feeding and sitting. Whereupon I left.

This performance was accompanied by several different kinds of display, in addition to soliciting. The most common additional forms of display were GHAC's and ChK's. Both were very common during the first few minutes after Green was introduced.

Most of the GHAC's were uttered by Green, I think. During the period after he was first introduced, he uttered them whenever he landed by himself as well as whenever he landed beside White. These initial GHAC's were always loud & vigorous. I am fairly certain that White also uttered GHAC's quite frequently in the same circumstances at the same time. Once (at least) White uttered a typical burst of GHAC's when she landed by herself after escaping from Green! Later on, when the birds appeared to have become a little more habituated to one another, the frequency of their GHAC's declined somewhat; but they were still not uncommon when I left.

The GHAC performances were slightly variable in form this afternoon. I think that the basic, single GHAC Note might be transcribed by something like "Whā-āuh". A definite trace of syllabic division. I think that

Acemouops, Apr 18, 1960, III

(11)

almost all bursts of GHAC included at least 3 or 4 of these typical notes. Some bursts may have included 5 or 6. Some of the bursts of GHAC this afternoon were apparently composed of typical GHAC Notes alone. Others were preceded by "introductory" notes. Sometimes a bird uttered a single "Whizzoot" Note just before a series of typical GHAC Notes. (The possible significance of "Whizzoot" Notes is discussed in more detail below.) These "Whizzoot" - GHAC performances reminded me somewhat of the See Note - HAC performances of Black-capped Saltators (see my notes on Saltator, Apr. 12, 1960, p. 31). At other times, a bird uttered a series of very brief & rapid notes just before a series of GHAC Notes.

These brief & rapid initial notes are difficult to describe. Sounded quite like the ordinary CN's of many other species, but not particularly like any CN's of this species I have heard. Quite soft. A single one of these short introductory notes might possibly be transcribed by something like "Tik" or "Tuk" - but I am quite uncertain about this.

I could not determine what were the causal differences (if any) between these different types of GHAC performances.

The ChK Notes usually occurred when White was escaping from Green. I think they were usually uttered by White. This suggested that they may be alarm reactions or, at least, produced when the escape drive is slightly stronger than the attack drive.

As far as I could tell, neither the GHAC Notes nor the ChK Notes during these reactions were accompanied by any special ritualized postures or movements. There was certainly no trace of either CR or "song" (what I called "R" above) at any time this afternoon.

Before I forget, I should mention that the ChK Notes stopped fairly early this afternoon - long before the GHAC Notes. This would suggest

est that the ChK is a higher intensity pattern than the GHAC, as well as being less aggressive.

By far the most elaborate pattern this afternoon was the soliciting by White. Essentially an extreme development of the soliciting pattern of related species.

The "basic" element of soliciting was an extreme ft. Posture, with extreme fluffing of the breast and belly plumage, and extreme raising of the tail. This was usually (but not always) accompanied by Q and soft "Whooooo" Notes. These "Whooooo" Notes were very soft and plaintive (very much softer and quite unlike the "Whoooooot" Notes mentioned above & discussed below). Always uttered in long series, one right after the other.

I shall call these notes "Wh" Notes. There was obviously no definite "fixed" or typical number of Wh Notes to a series. White just continued uttering Wh Notes as long as she continued soliciting (in certain circumstances - see below), and the length of time she spent soliciting was extremely variable. The bill was kept slightly open throughout a whole series of Wh Notes, without any tendency to close between successive notes. The loudness of the Wh Notes was slightly variable, within fairly narrow limits. They seemed to be loudest when soliciting was most intense. The bill was opened slightly wider when the notes were relatively loud than when they were relatively soft.

Actually, White seemed to have 2 slightly different types of soliciting patterns this afternoon. She usually began when Green was not too close to her. In such circumstances, her head and bill were lifted relatively high (see accompanying drawing) while her tail was not lifted very high. In such circumstances, she also performed extreme Q and uttered Wh Notes. If the ♂ approached her while she was soliciting in this manner, she

Amurmonops, Apr. 18, 1960, IV.

(13)

Selecting Postures

I am not sure if the bill remains open
after Wh's stop

Base of lower mandible
is white-ish or silvery

White throat quite
prominent in both postures

Gray Crown movable in both
postures



Notice
back of head
shape.

Extreme Posture
when σ is close



Notice
breast

Tail apparently
never spread or fanned.

Sometimes the tail is almost horzontal
in this posture.

Less Extreme Posture (+ σ)
when σ is not close.

Chlorophaps, Apr. 18, 1960, VII.

(14)

frequently raised her tail higher (as in drawing on preceding page), which necessitated lowering the head a little and pulling the breast in (the head was sometimes lowered even further, i.e. pointed diagonally forward more, than in the drawing on the preceding page). At the same time she frequently stopped Q (leaving the wings resting on back) and Wh Notes!

(It is possible that she sometimes stopped Q without stopping Wh Notes, and/or sometimes stopped Wh Notes without stopping Q, but such cases were at least relatively rare. Q & Wh were always or almost always very well correlated and stopped together.)

White may have stopped the Q and Wh when the ♂ approached her because she was afraid of him. She certainly had cause to be! Possibly in the case of a better acquainted or adjusted pair the ♀ would have continued Q and Wh until (and possibly after) the ♂ had mounted.

As far as I could see, Green never did mount White (or mount her for more than a brief period during some "pounces") this afternoon.

The only other displays I observed this afternoon were a few single "Whiceoot" Notes (like the one preceding some CHAC Notes). Usually or always uttered by White - I think. Some time after Green had been introduced, when the birds were beginning to calm down a little. Usually or always uttered when White was some distance away from Green - I think. Not accompanied by any special movements or postures. These "Whiceoot"s may have been the same thing as the "Whiceo" Note mentioned above on April 7, 1958, p. 4. They may also have been attempts to "call in" the mate. (I might also add that these "Whiceoots" were slightly reminiscent, in sound, of the double-note "Whit-chu"s which usually precede the full song of the species.)

When Green did not respond to White's soliciting in any way (after they had been together for quite some while) she would just stop eventually.

Memoranda, Apr. 18, 1960, VI

(15)

without any further display. This relaxation was usually followed immediately by one or two BW movements — which may well have been quite ordinary comfort movements.

Memoranda, I

April 20, 1960
Barro Colorado

I watched Green and White again for a couple of hours this morning. They seem to have settled down quite nicely together, but their behavior has become relatively uninteresting. White seems to have quite stopped soliciting (she spent some time this morning incubating her infertile egg — so I threw it out). Green has almost or completely stopped supplanting and/or "pouncing".

Several times this morning, when Green was by himself, he uttered single long "Whooooot" Notes, just like the ones I heard on Apr. 18. (I shall call these "WW"). Further confirmation that these notes are used to "call in" the mate.

He also uttered a few slightly different notes in similar circumstances. Always single also. A note of this type might be transcribed by something like "Tseweeeeeeet" (I shall call such notes "TWW"). I think that the TWW may be nothing more than a "variation" (higher intensity???) of the WW. Possibly also used to call in the mate.

Actually, Green uttered more TWW's than WW's this morning. This might perhaps indicate that he is highly motivated.

The TWW is even more like the See Notes of the Black-capped Saltator than is the WW.

(I did not hear White utter either TWW's or WW's this morning.)

Memoranda, Apr. 20, 1960, II

(16)

so possibly my identification of the bird that uttered WW's on April 18 was wrong.)

There was quite a lot of GHAC - by this morning, certainly by Green and possibly by White; but it was less frequent, and seldom as loud, as on April 18th. Green occasionally uttered GHAC's when he landed on a branch by himself; but he usually uttered these notes when he landed near the ♀. Most, but by no means all, of these GHAC's were moderately loud and not preceded by other special introductory notes.

Occasionally Green uttered a series of notes which were very much like ordinary GHAC's, but much softer. Might perhaps be transcribed by something like "Wah wah wah wah..." (I shall call such notes "MHAC") As the preceding transcription would indicate, individual MHAC Notes are not crystalline like all or most GHAC Notes, and they are also shorter than all or most GHAC's. MHAC's were much rarer than GHAC's this morning, but seemed to occur in somewhat similar situations. I think that Green uttered all his MHAC's when landing near the ♀, particularly when she was on or near the nest. It seems likely that all the MHAC's are either low-intensity GHAC's and/or intermediate between typical GHAC's and "MCN's" (see below). I never heard a burst of MHAC preceded by any special introductory note(s).

Another distinctive call which Green uttered several times this morning was a series of soft, very short, notes which I find almost impossible to transcribe adequately. They might, however, be very crudely rendered as "Tik tik tik tik..." I think there were usually 3 or 4 such notes in a single series. (I shall call such notes "MCN's"). I think they are the same thing which I heard before preceding GHAC's (see Apr. 18, 1960, p. 11); but Green uttered his series of MCN's without any following GHAC Notes this morning. Again, he uttered his M-

Memoranda, Apr 20, 1960, III

(17)

CN's when landing (and sometimes, perhaps, when flying from perch to perch) near the ♀ when she was near the nest.

A couple of times this morning, when the ♂ was flying or landing near the ♀ when she was on or near the nest, he uttered a series of brief soft notes which were almost "warbling" in effect. I was not able to analyze these peculiar performances, but I think that they may have been largely or completely aberrant series of MHAC and/or MCN Notes.

None of the MHAC, MCN, or "warbling" performances were accompanied by special ritualized postures or movements.

I watched another pair of Green Backs very briefly near Frijoles yesterday. They were sitting side by side fairly high in a bush. Most of the time they were both preening, but every once in a while one bird (usually the ♀) would hop over the other, or, at least, hop to a nearby twig and back again. Every time one of the birds would make a vigorous movement of this type, both birds would utter a burst of GHAC — in spite of the fact that they were never more than a few inches apart at any time. This was quite reminiscent of Taltator coerulescens.

I also noticed that both birds kept their bills moderately well open, without a trace of closing between successive notes, throughout each burst of GHAC's.

Memoranda, I

April 21, 1960
Frijoles

Watching the same pair of Green Backs (let us call them "A") as described immediately above. One bird of the pair (at least) frequently uttered single TWW's when separated from its mate. I saw again & again that such notes were seldom followed immediately by flight.

Ammonops, Apr 21, 1960, II

(18)

While the A birds were feeding on the ground, one bird performed a vigorous burst of vertical tail-quivering (possibly the same thing I called "T Qu" on July 16, 1958, p. 7) just after landing after a long hop or short flight. Quite thrush-like looking.

Ammonops, I

March 24, 1961
Barro Colorado

I saw what seemed to be a boundary dispute between 2 pairs of wild Green-backs around 8:00 a.m. this morning.

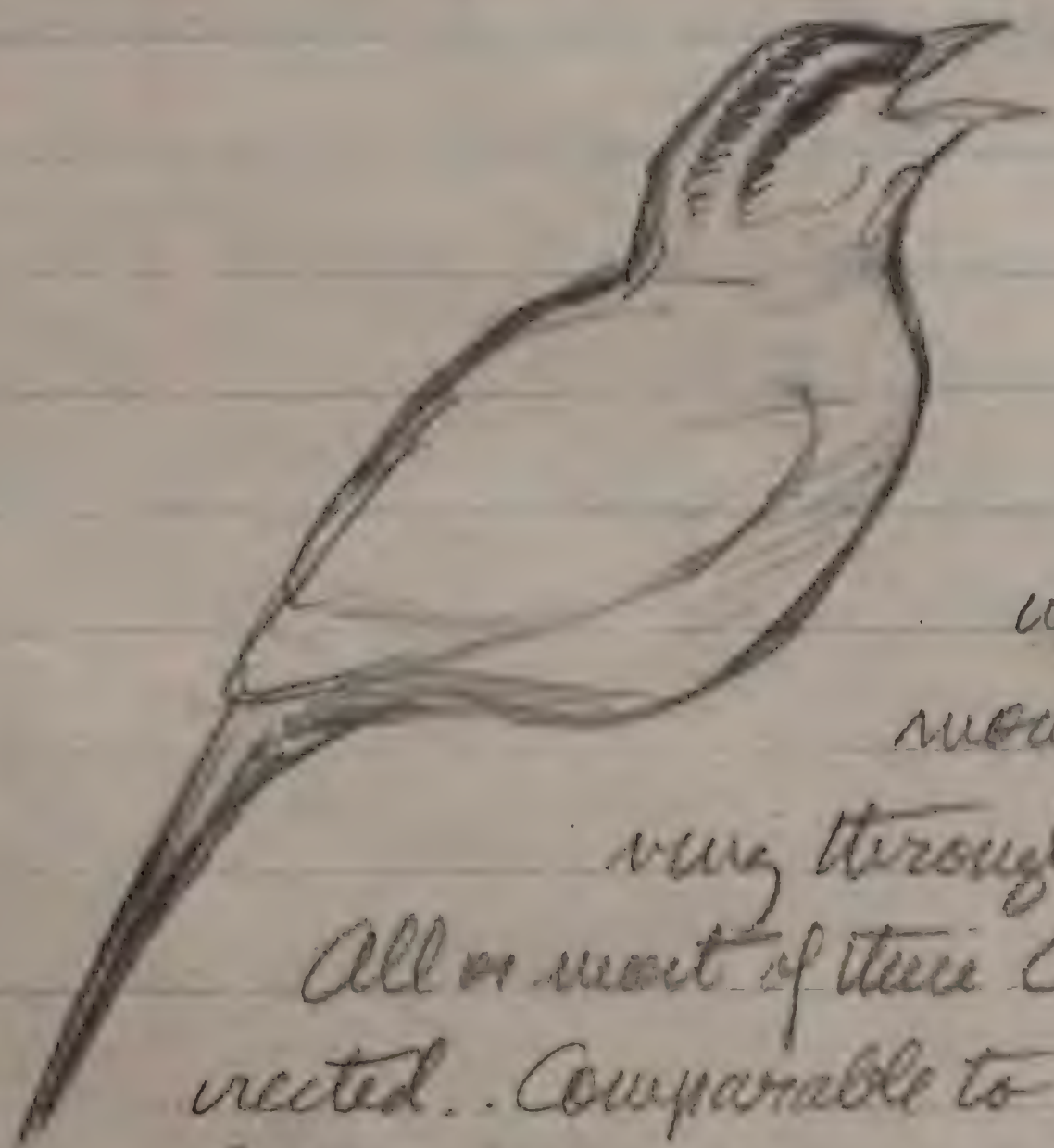
The 2 pairs hopped and flew through a long series of bushes and shrubs (extending over at least 500 feet). More or less parallel. Never came within more than a couple of feet of one another.

Their displays or lack of displays were interesting.

None of the birds appeared to direct any displays toward birds of the other pair. But both birds of each pair uttered many, many GHAC's among themselves. These GHAC's sounded quite ordinary. Usually accompanied by the posture drawn here. But they were uttered even more frequently than when a pair is moving through the shrubbery by itself.

All or most of these GHAC's seemed to be at least partly directed. Comparable to a "triumph ceremony".

Interestingly enough, there was absolutely no trace of song during this encounter. Nor any special ritualized postures or movements. Certainly no st



Memoranda, I

March 23, 1961
Barro Colorado

I just realized that one of the pairs I have been seeing around the clearing quite frequently (one of the pairs involved in the boundary dispute described above in yesterday's notes) are old Green & White.

I watched them again very briefly this morning.

When flying from one tree to another, the leading bird of the pair uttered long whistle-like notes. Obviously what I called WW by one. I think that most of the WW's I heard today might be transcribed by something like "Tseeeeroot".

It is obvious, I think, that the WW's and TWW's of this species are homologous (& presumably analogous) with the SN's of the Blue, Palm, and Plain-colored Tanagers, and the PN's of Sangre de Toros.

In the case of the incident described above, when Green and White were flying and one bird uttered WW's in flight, both birds uttered G-HAC's, as usual, as soon as they landed (together).

Later on, one of these birds uttered WW's when perched a few feet away from its mate.

Memoranda, I

March 24, 1961
Barro Colorado

I saw a really violent dispute among 3 Green-bodies today. One bird chasing another through the air, followed by a third bird (probably the mate of the more aggressive of the other two birds). The aggressive chasing bird occasionally caught up with the fleeing bird and pecked it, but the fleeing bird always got away immediately, and the chase was re-

used. All this behavior was accompanied by noisy court air HAC (louder, harsher, and more irregular than typical GHAC) and many single, loud "Chauk" Notes. These "Chauk" Notes were both nasal and metallic. I suppose that these "Chauk" Notes are closely related to the "chuck" Notes I have heard uttered by this species before, but they were undoubtedly distinctive. Sounded as if they might be very high intensity. I think, but cannot be sure, that the chasing bird uttered some of the "Chauk"s. I am almost certain that the aggressive chasing bird uttered at least some of the HAC.

After a few seconds, the fleeing bird and the aggressive chasing bird disappeared from sight. But the presumed mate of the latter remained behind, perched a few feet from me. There, it certainly uttered many "Chauk" Notes. At first very loud and rapidly repeated. Gradually becoming slightly softer (although still remaining nasal and metallic), and uttered at gradually longer intervals. Apparently "running down". Then this bird also flew away from sight.

I think that this bird which remained behind may have gone into a posture like the "High Bowing" Posture of Atlapetes similis (see notes on Atlapetes, May 30, 1960, p. 30), very briefly, when it first landed on the perch where it remained. If so, this posture was also accompanied by "Chauk" Notes.

I am fairly certain that the pursuing pair in this incident was composed of Green & White.

In any case, Green & White appeared (again) after a few seconds. One of them (presumably the ♂ — presumably Green) began to utter song immediately, in spite of the fact that its mate was present. This song was not complete. Approximately "Whit - chue whit - chue whit - chue chue chue". Interestingly enough, however, this was the

Memoranda, Mar. 27, 1961, III.

(21)

first Green back song I have heard in several days. Possibly a "triumph" performance??

Memoranda, I

May 30, 1961
Frijoles

Have been watching birds near the RR station, during the early morning, both yesterday and today.

This species is always or almost always the first of the local species to begin singing in the morning. Well before sunrise.

I have been paying special attention to the songs of this species. Especially one ♂, right across the tracks from the station. This ♂ (which I shall call "Z") begins to sing particularly early and continues to sing particularly vigorously until well after sunrise.

I have been surprised, these last 2 mornings, by how much of the early singing consists of the "Whit-chu"s, and related notes, (which I used to think was essentially "preliminary"), and how little consists of the "accelerando" (which I shall call "Acc" from now on).

The songs uttered by Z have been somewhat variable this morning. Comme ça:

"Wheet chu Wheet chu Wheet Wheet Wheet Wheet chu
Wheet Wheet Wheet chu Acc ('chu-chu-chu...')"

"Wheet chu Chewa Chewa Chewa Chewa Chewa Chewa
Acc ('chu-chu-chu...')"

"Whit Chu Whit Chu Whit Chu Whit Chu Whit Chu Whit
Chu Acc ('Chu-chu-chu...')"

Once this morning, the Z bird uttered an even more distinct
series of notes, obviously a variation of the usual pattern.

"Whit Chee Chu Whit Chee Chu Whit Chee Chu
Whit Chee Chu Acc ('Chu-chu-chu...')"

These "Whit Chee Chu"s were

I am now sure that the "Whit" and "Whist" Notes of these
patterns are closely related to WW and TWW. I think I shall call them
"SSN"s from now on. The "Chee" Notes of the song transcribed immedi-
ately above were probably only slightly aberrant SN's.

The "Chwa" Notes of some songs are probably only variations of
the ordinary "Chu"s. Possibly tending slightly to SN's.

As far as I can tell, the Acc's are always composed of "Chu"s.
The fact that this bird which sings so vigorously utters so rel-
atively few Acc's, and so relatively many SSN's and other types of "Chu"s
might suggest that songs with many of both the latter types of notes and
few Accs are higher intensity than songs with many Accs and few
SSN's or independent "Chu"s.

The occasional series of SSN's alone are, of course, particularly
reminiscent of the high intensity dawn songs of the Sangre de Toros, Salta-
tors, and the Yellow-throated Bush-finch.

The series of "Whit-Chu"s are particularly reminiscent of the
PCN-ACN performances of the Sangre de Toros and the "Kew-Kroo"
song.

s of the Striped Saltator (see for instance p 48, Mar. 30, 1961, of my notes on Saltator).

Listening to the song of various Green Grackles, I have noted that either the SSI's or the "Chu"s or both the "Whut-Chu"s may have a slight rattle undertone at times. I think Z usually has a rattle undertone to the SSI's but not the "Chu"s.

Z usually sings from a rather high (10 feet off the ground) exposed perch. Higher and more exposed than any other birds of this species I have seen singing. Usually in posture something like:



All the time Z sings, he is obviously visible. Even when he stops singing he appears briefly (as he sometimes does, even very early in the morning — presumably going to feed), I never hear any CHAC's coming from his area. His songs must be produced by frustration of pairing and/or sexual drive(s).

This seems to be equally true of all songs of all other birds of the

Memoranda, May 30, 1961, IV.

(24)

s species. I have never seen a bird sing when its mate was near. And I have never heard song during a purely hostile dispute.

When Z finally does stop singing after sunrise, he usually, I think, stops completely. No brief resurgences later in the morning. Why? Mate incubating?

Another bird, not too far from Z, sang slightly different songs this morning. Could be: "Who-est Chu Who-est Chu Who-est Chu"

I spent most of the later part of this morning watching 2 other pairs of Green-backs. The ♀ of one pair ("X") was nest-building steadily almost all the time I watched. The 2 birds of the other pair ("Y") stayed together all the time. Presumably not incubating or even nest-building yet.

I first noticed the X pair when they were feeding together on the ground. Uttering usual GHAC's whenever they came close to one another. Then one of the Y birds flew up and landed in a bush about 5 feet away from the X's. The X pair immediately retreated. All 3 birds silent. The third bird remained sitting in its bush for some seconds. Then began to utter "Whit Chu"s (so this third bird was presumably the Y ♂). Then this third bird was joined by its mate, apparently in response to the "Whit Chu"s. Both Y's GHAC. Then they started to advance, hopping, toward the X's. The Y's repeatedly supplanted the X's. All 4 birds were silent throughout. But once one of the Y's hopped rapidly forward, toward the X's, in an unwritten crouched posture with CR and extreme BF (breast-and-belly-fluffing) with its wings held out from the body slightly (the whole wings - not just coxae). The X birds eventually left the area completely - temporarily.

Memoranda, May 30, 1961, V.

(25)

Around 8:15, I saw another territorial encounter between the X and Y pairs. Less vigorous and less one-sided. The two pairs just hopping about near one another. Whenever one bird of one pair came close to its mate, it uttered GHAC's. There sounded quite ordinary, but there were many more GHAC's during this period when the 2 pairs were fairly near one another than at any other time this morning. Possibly the members of the pairs were redirecting their hostility. (Or was the increased frequency of GHAC's simply due to the fact that the members of the pairs came together more frequently when another pair was nearby them at other times ????)

Both the X and Y birds uttered quite a lot of WW's and TWW's (I shall call these both "SN"s from now on) whenever they became separated from their mates and no other Greenbacks were around in their vicinity.

The behavior of the X's during n.b. was interesting. As far as I could tell, only the ♀ built. When the ♀ brought n.m. to the nest site, the ♂ usually or always accompanied her, usually landing a few feet away from the nest (while the ♀ usually went on a little further and landed very close to the nest). Both birds quite silent when approaching the nest. Then the ♂ usually or always flew to any one of several nearby bushes and sang while the ♀ went to the nest and did the actual building. Then, when the ♀ finished building, she either flew to the ♂ or he flew to her and the 2 birds then flew away together. Usually gone several minutes (the ♀ presumably collecting n.m.) before returning again.

Most of the ♂'s songs while the ♀ was n.b. reached the A stage fairly rapidly. Relatively few repetitions of SSN's, "du"s, or "Whit du"s apart from A's. The ♂ did not usually sing

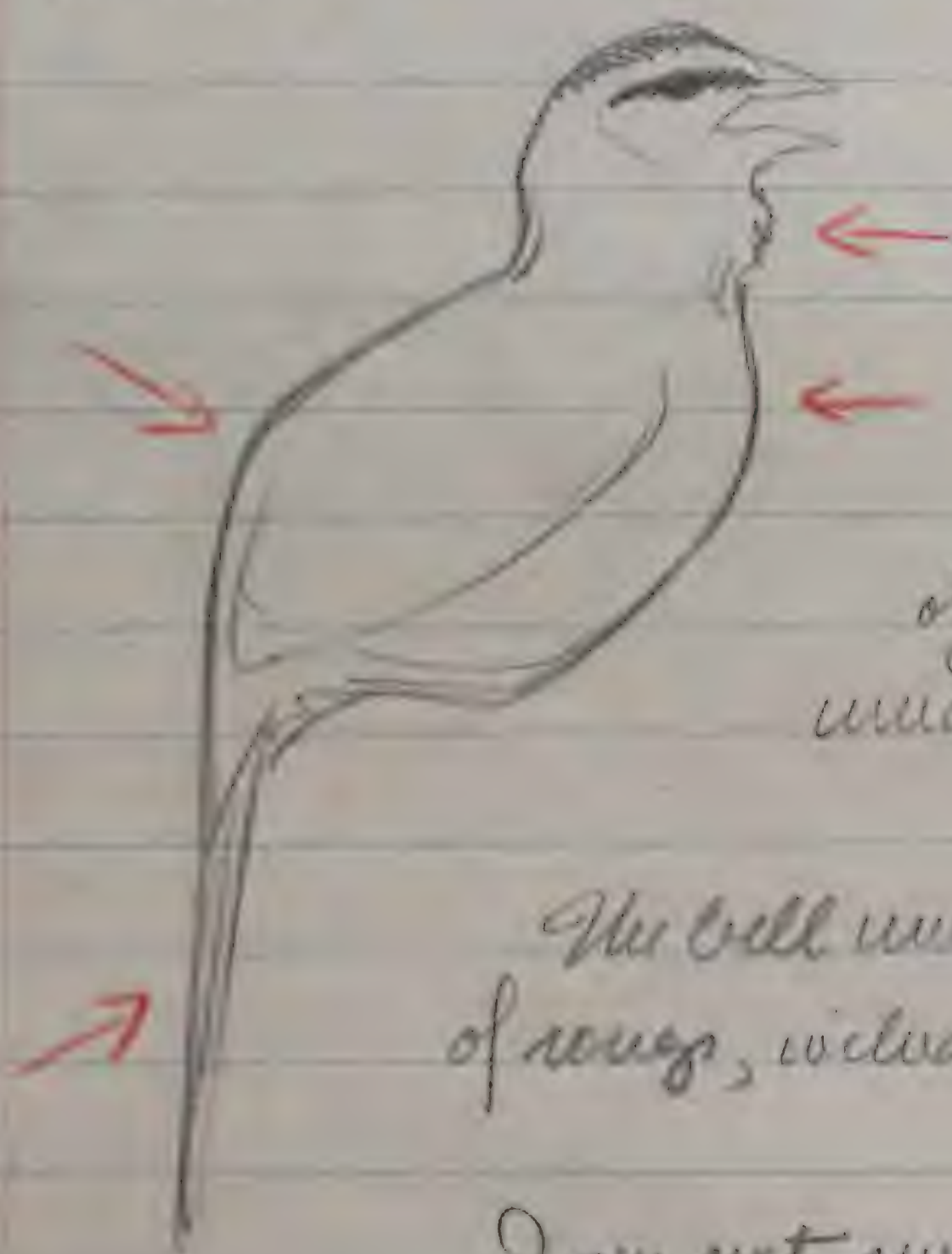
Ammonops, May 30, 1961, VI

(20)

very steadily throughout the periods when the ♀ was n.b., and I rather thought that his songs at such times were relatively low-intensity. His SSN's were always "Whit"s.

His usual song postures at such times were more or less comme ça

No CR?



Head usually rounded. More or less horizontal. "Break" in back. Tail more or less straight down.

I am not sure of the position of the wings; but I think they were usually more or less like this.

The bill usually or always OCB with all notes of songs, including SSN's, "Chu"s, & all.

I am not sure of the status of CR in connection with the song patterns of this species. I think that the X ♂ (and Z) did not usually have CR when they sang.

But once, at least, the X ♂ had definite CR when he accompanied the ♀ to the nest, and retained the CR after she left him and he went away and began to sing.

Once, when the ♀ finished n.b., she sat on a perch near the nest-site and uttered 1 SN. The ♂, who had been singing about 10-15 feet away, immediately flew to her, uttering 1 SN in flight. He landed right beside the ♀. Silent. The ♀ immediately hopped on

Ammonops, May 30, 1961, VII.

(27)

ay. The ♂ then stood for a few seconds with CR & BF still silent. Another time, the ♀ flew straight to the ♂ after n.b. Land ed quite close to him. The ♂ then stood with CR & BF, performing frequent & extreme WF's & TF's. Both birds silent. Then both birds flew away.

Sometimes, while the ♂ was waiting for the ♀ to finish n.b., he would utter quite a lot of Chk Notes instead of singing. Probably alarm. Seemed to be correlated with my movements.

Several times, when the Y birds were feeding more or less together, when the X birds were not close by, the two Y birds would utter slightly distinctive GHAC Notes "Whoaaa Whoaaa Whoaaa" These sounded as if they might be partly intermediate between typical GHAC's and SN's. Had something of the urgent quality of the latter. I think the Y birds uttered these notes when they came close together, but not too close!

Ammonops, I

May 31, 1961
Trujillo

Back to X-Y area at dawn, 5:40 a.m.

A little song from areas of both pairs, but not much. The ♂'s of these pairs seem to be singing much less than 2 yesterday and the day before.

X ♂ is not near the nest when he does sing now. I can't even see him.

Now, 5:55, neither pair visible or audible! Still not at

6:10

X's finally show up, 6:25 a.m. SN's and GHAC's as usual

Memoranda, May 31, 1961, II

(78)

♂ X starts to sing. What does he do while ♀ collects n.m.
Her "What" is more rattle undertone.

Then both X's start to feed (after ♀ has taken n.m. to nest?)
♀ X back to nest with n.m. ♂ doesn't accompany her,
starts to sing (with early A's) where she left him.

♀ leaves nest, utters SN, flies to ♂, mutual GHAC. Both
feed, near Y boundary.

1 Y flies up, lands in bush about 10 yards away. Utters
GHAC as it lands by itself. Then goes away again.

Then Y joined by mate (♀). Mutual GHAC. I see that this
Y ♀ is also carrying n.m. 6:35 a.m. !! ♀ Y flies away, presumably
by taking n.m. to nest. ♂ Y remains behind, starts to sing. Thro-
t or less as usual. Head rounded, but no real CR. Wings slightly
drooped, insofar as they do not meet over base of tail.

All 4 birds gone again in a few minutes (although I can still
see the Y's in distance). Not back by 6:45.

There is no doubt but that the birds are far less active today
than yesterday. Why? Possibly because it rained last night, and ev-
erything is still sopping wet now ???

X ♂ singing somewhere nearby 6:55 a.m. ♀ feeding on
ground answers him by SN's. Then ♂ starts to feed too, not too cl-
ose to the ♀.

♂ noticeably larger than ♀ in this pair

♀ utters single SN's from time to time while feeding. Especi-
ally just before flying a foot or so. This sometimes induces ♂ to come
a little closer or, at least, follow her.

X's get close to Y territory again. Y's fly up, land about
10 feet from X's. Again members of both pairs do some "redirected"

GHAC - wing

♂ Y is also noticeably larger than ♀ Y

X ♂ singing again in distance. This time lots of "Whit" clm's. No Acc. Again "Whit"s have rattle undertone

X ♂ singing again in distance. This time with Acc's. This time the independent "clm"s have rattle undertone, but the "Whit"s do not. I am beginning to think that the presence or absence of rattle undertone is not very significant.

After being away long time, X pair back, feeding, 7:45 a.m. Difficult to see them well. But every once in a while ♂ comes close to ♀ and begins to hop around rather actively. With definite bowing. Can't tell if this is ritualized or not. Combined with CR & BF (both extreme). All quite silent. The ♀ does not respond in any way. ♂ does this repeatedly. Every once in a while, he begins to sing when he becomes separated from the ♀. When this occurs just after he has been bowing with CR & BF, he tends to retain the CR and BF through the singing.

Then ♀ flies to a bush a few feet away. ♂ follows immediately. ♀ immediately goes into soliciting, just like my captive bird. No notes, extreme ft, TV, & S. ♂ perched on branch a few inches above her. Can't see him well, but apparently with CR & BF. Does not attempt to mount. ♀ stops soliciting. BW's twice just as she stops. Both birds fly away.

Then I think a copulation occurs out of sight! ♀ reappears and starts to preen vigorously. ♂ a few feet away begins to sing vigorously. 7:55. ♂ singing definitely without CR or BF. Then both fly away again.

This ♂ hopping & bowing near ♀ is probably significantly reminiscent of *Proleptophanes*.

Arremonops, I

(30)
June 1, 1961
Tupelo

Back in same area 5:35

Z singing as usual when I go past his area. Also some other nearby birds

Both X and Y also singing. Can't see them well (it is still not quite light yet). Y with many and early Acc. X with more SSN's and independent "Chu"s

Incomplete Acc's do not seem to rise in pitch appreciably (wide fluctuate). Complete Acc's do - a little - quite abruptly in some cases - just when the Acc notes become really fast

6:00 a.m. All observations stop because of pouring rain

At one time, early this morning, a bird which I presumed to be X ♂ (I couldn't see him) was uttering "triplet White Chu"s, like one of the birds I heard on May 30

The bird I heard uttering such calls

on May 30 was quite far from the X area. Almost certainly a different bird. Such "triplets" seem to be composed of 2 different SSN's followed by a "Chu"

Rem steps after approximately 15 minutes

Both X and Y pairs out, feeding busily

A few territorial encounters. Largely "redirected" GHAC's.

Apparently both ♂'s and ♀'s can utter SSN's.

Then all disappear again, and remain away for a long time

Much later, around 7:15, I see a pair of Green Cardinals in the distance. Probably the Y's. Feeding high in a tree, at least 40 feet off the ground. Much higher than I have ever seen any Atlapetes.

Memoranda, Jun. 1, 1961, II.

(31)

So far (7:40), the ♀ X has shown no interest in the nest-site at which she was working so busily 2 days ago. Frustrated off by me? (Actually, the ♀ doesn't seem at all shy, but the ♂ is obviously nervous about me; and he may have put her off.)

X's back in view 7:50. Usually feeding and/or preening → sings a little from time to time. Largely "Whit Chir"s.

He rather generally fluffed pectorals. Much of this fluffing may have been due to the fact that he is still damp. He interrupted his singing quite frequently to perform courtship activities.

(Notice forehead! It is quite abrupt.)
Back in back is not exaggerated.

Head rounded,
just a trifle
ruffled



♂ X stands with CR after uttering Chir's. Presumably alarmed by me or by a train.

♂ X lands near ♀. Bowing markedly. TV (diagonal). Can't see if he has BF and/or CR. (I think probably yes.) Carrying a leaf in bill! Utters rapid "Tut tut tut tut...". Somewhat irregular in rhythm. Like Chir Notes but softer (possibly even harder). ♀ doesn't respond, continues feeding. ♂ relaxes, flies off. ♀ follows. Both disappear from sight (in thicket where I think copulation occurred yesterday).

♀ X still hasn't shown any interest in old nest-site 8:30. One of the Y birds utters lots of Chir's when it gets close to me. With lots of WF's & TF's, but no CR.

Arremonops, I

June 2, 1961
Frijoles

Arrived X-Y area 5:40 a.m. Not raining, yet, but very heavily overcast.

Y ♂ singing vigorously. Lots of A's. Perched quite high (10 ft off ground) and very exposed. Flies to mate, lands beside her. Neutral (?) GHAC. Then ♂ stands silent, for a second, with CR and extreme BF. Then flies back to old perch and starts singing again.

X ♂ also singing, after dawn "Triplets" - like yesterday. With definite CR!

Then Y ♂ lands by himself, uttering "Tuk tuk tuk..." Notes. (Y ♀ is about 10 ft away on ground.) Then stands, uttering a few "Whit Chu" calls, not loud or steady. Every once in a while he would suddenly lift one wing (sometimes one, sometimes the other) slightly above the level of the back, spreading the wing horizontally at the same time, and quivering it a little!!!! The whole performance was reminiscent of the Brown-capped Bush-tanager and the Yellow-throated Bush-finch. These wing movements seemed to be partly, but not completely, synchronized with the "Whit Chu"s - especially the "Whit"s. Possibly accompanied by CR, but I can't be sure of this.

Then Y ♂ down to join ♀. Neutral GHAC. No more. Then ♂ flies away again. Hops about in bush, approximately 20 feet from ♀. Then suddenly assumes extreme BF (+CR?), lifts both wings out of body feathers, and lifts them slightly but definitely above back (this movement was not extreme - wings not spread at all). This wing-lifting quite silent. Then Y ♂ relaxes and hops away again.

Arremonops, Jan. 2, 1961, II.

(33)

When X ♂ did this second, silent, wing-lifting performance, he was quite near the Y birds. I thought this performance might be purely hostile, directed toward the Y's. It was very reminiscent of some wing-lifting I saw during an X-Y encounter dispute a few days ago.

The first, single wing, wing-raising performance may have been partly sexual. (The "Tuk tuk tuk" notes may be significant in this connection ??)

The probably hostile double-wing lift may be homologous with the similar pattern of Palm Tanagers.

I have now seen X ♂ singing by himself again. Both "Whit Chu"s and Acc's. No CR. No wing-movements at all. Songs interrupted by quite a lot of preening. Probably not displacement.

I wonder if the wing-lifting during the "down-songs" of the Yellow-throated Bush-finch is single-wing wing-lifting ???

X ♂ singing by himself, on high perch. Both "Whit Chu"s and Acc's. In exactly the same posture as the one drawn on p. 31! (This posture might be called "Jiffy singing posture".)

All the birds have been very dull since about 6:10. Just busy feeding. There are occasional showers now (7:00) but no down-pours yet.

X ♀ hasn't shown any interest in me yet.

♂ X singing again 8:00 a.m. No Jiffy. Then flies to ♀. Mutual GNAC. Both birds flit about very rapidly. Then ♂ flies away, leaving ♀ soliciting (as before) on top of a stump. ♀ quickly stops, starts to feed.

Whenever the ♂ X is near the ♀, at times when soliciting is actually developing, or looks as if it will develop, the ♂ is particularly likely to utter click notes. These seem to be directed toward me; but the ♂ is particularly likely to utter such notes at such times, even when he

Ammonops, Jun 2, 1961, III.

(34)

is quite far away from us — at distances at which he does not utter
click Notes in other circumstances. I.E. the presence of the ♀ in such cir-
cumstances raises his escape drive.

8:30 X ♂ singing again, by himself. With both GFF
and CR. Both 'Whit Chu's' & 'All's'.

Well! I finally saw ♀ X emerging from the nest. (I don't
know how she got there.) The outer part of the nest is about 2/3 com-
pleted (not covered yet).

Ammonops, I

June 3, 1961
Frijoles

Arrived usual area 5:45 a.m. Like yesterday. X ♂ appa-
rently singing vigorously. Lots of All's. X ♂ apparently silent.

Then find X ♂ singing, not too close to nest-site. Still
not very vigorous or steady. Usual type song. His SSN's still have
rattle undertone (this may be a definite individual characteristic of the
X ♂ ???). Singing in usual more or less unrotational posture. No G-
flff. Head rounded, but no definite CR. Definitely by himself, as usual
with singing birds.

One unusual song by X. SSN - SSN - SSN - All. Usual
songs approximated SSN - Chu - SSN - Chu - SSN - Chu - All. All's
generally frequent and early. Frequently not quite complete also.

Then ♀ X appears, 20 ft away. ♂ stops singing, flies to join
her. Utters SN as he does so. Mutual GNAC as greeting. ♀ flies on a few
feet. ♂ stays behind. Stands with CR (no BF) doing WF's and TF's.
Then relaxes, begins to feed.

The fact that CR can be given without BF, although I have a

even when BF without CR would suggest that CR is lower intensity than CR + BF.

♂ = ♀ X feeding rather far apart. ♂ picks up large dead leaf and suddenly flies to stump near ♀, uttering "Tuk tuk tuk tuk..." as he does so. Then stands a minute, reluctantly drops leaf, flies to tree, starts to sing normally.

There is no doubt but that this "Tuk tuk tuk tuk..." is sexual, or something closely related to it. But what ???

I shall term this call "Tuk", tout court, from now on.

Differences between Tuk's and Chk's in form is clear. Tucs apparently always rapid series. Chk's apparently always essentially single, although often repeated. Tuk's apparently always a little less loud than Chk's. Tuk's may have "tuh" undertone, but no, I think, say some or all Chk's.

Then the Y pair comes close to the boundary of X territory. Both X's rush over to confront the Y's. Usual type of territorial dispute. Lots of "redirected" GHR between mates. Also... One ♂ X stands in alert posture, with extreme BF and slight CR. ♂ Y also stands in similar posture, with BF but no CR. Both quite silent in such postures.

This behavior would certainly suggest that BF is hostile. Slightly on the aggressive side ?? (Both birds did BF when they were not actually fighting.)

The ♀ X has shown no interest in the nest site yet today (8:00 a.m.). I am fairly sure that she has not selected another nest site, as she doesn't seem to be collecting n.m. at all.

(It is interesting, in this connection, that the morning has been dry — although it rained last night.)

Both the X and Y pairs seem to have definite routes which they follow when foraging on their territories (And they obviously do use their territories as feeding grounds). Seldom diverge from these routes, except when obviously disturbed, by neighbors and/or human intrusion. But the speed with which they progress along these routes is obviously very variable (at least on a short-term basis).

The ♀ usually hops in front of the ♂, when they are undisturbed. Presumably, due to the fact that she is less shy.

Around 8:30, the X birds stray over into Y territory. Eventually a Y (♂?) flies up, lands about 10 feet from X's. Utters SN as it lands, although its mate does not seem to be present. X's immediately fly away, land about 20 ft away, in their own territory. Utters usually loud & harsh G-HAC as they do so. Obviously at least partly relaxed.

These birds seem to have a tendency to utter "G" HAC when they land, even when they land by themselves. Presumably the result of conditioning. In any case, the G-HAC seems to be almost on the verge of developing into a "Landing call" pure & simple.

The incident described above would suggest that the SN pattern may show the same tendency.

It certainly looks as if the X birds have almost completely given up sex, at least for the time being!

X ♂ mugging in fluff posture now. This seems to be characteristic of fairly late in the morning. Why? Sign of relaxation? The fluffing may be suppressed early in the morning because the birds are almost always ready to fly at such times. (They frequently assume unritualized pre-flight postures, with WF's and TF's, between bouts of song early in the morning.)

Adelphiops. I

June 2, 1961
Frigates

Arrived usual X-Y area 5:43 a.m. Light rain

After not watching the birds for 2 days, I found an egg in the X nest yesterday evening (6:10 p.m.). Still only a single egg there this morning. Bird apparently not incubating (although it was so dark when I arrived that I couldn't tell if I put a bird off the nest at a distance).

Both X and Y ♂'s doing a little singing, as usual. Y much more than X, as usual.

Now, 5:55 a.m., ♂ X singing vigorously. Lots of Ace's. Doesn't seem to have met the ♀ yet this morning.

Now I see why! The ♀ is incubating. Still only 1 egg at 6:05 a.m. I flushed her off nest. ♂ joins her. Usual CHAC. Both start to feed. Utter a pair. Some undirected "CHAC". Then Y's leave again. X's continue to feed.

Slight CR?



Isel Juved ???

Then there was a very long sustained dispute, involving both birds of X pair and another bird. (I never saw this other bird well. It was probably a wren or a frigatebird of some sort. Very skulking.

Probably *Lateralus albigularis*

Brownish.) This dispute involved a lot of short attacks and retreat movements, accompanied by lots of display, and interrupted by long "ten" periods of display alone.

The X birds uttered Chk Notes, "retracted" GHAC, and HAC Notes during the dispute. (Also ISN.)

"Retracted" GHAC as usual.

Chk Notes probably not usually accompanied by special display movements or postures, except, possibly CR and/or BF.

The HAC Notes, however, were usually accompanied by a very extreme posture, drawn above on the preceding page, which I shall call "BV Jff." Slight ruffling of crown feathers. Extreme ruffling of breast & belly feathers. Breast feathers forming a conspicuous tuft, usually well separated from tuft of belly feathers. Head usually low. Neck usually partly retracted, sometimes almost completely so (almost as in an H). At the same time, the wings were spread more or less horizontally, just waved. Yellow carpi very conspicuous. Wings sometimes, but not usually, drooped a little as well. Back feathers not ruffled, possibly slightly fluffed. Tail possibly fanned?

This BV Jff was usually assumed by a bird moving slowly toward its opponent. I.E. it is high intensity, slightly on the aggressive side. When the bird uttered HAC's, the bill opened & closed with each note.

The HAC's were very harsh, with a sort of rattle undertone.

The BV Jff's were not always accompanied by HAC. Sometimes silent for a few seconds between HAC's. Possibly also sometimes accompanied by Chk Notes instead of HAC.

This BV Jff is obviously an extreme development of a posture I got a brief glimpse of during a dispute between the X and Y pairs.

a few days ago (see p. 24 - June 24)

I think that only the ♂ performed the extreme B/Hff + HHC patterns during this dispute. The ♀ probably did little more than participate in the "redirected" G-HAC performances. She tended to remain perched, slightly above the disputing birds, silently watching the dispute.

Once when she was perched silently watching the dispute she performed a burst of vertical tail-quivering. Is this a "displacement" comfort activity???

Off again by 6:30. Then I go around looking for some of the other birds in the neighborhood.

Y singing a lot. Mostly more or less as usual. Also 1 song with Acc which first accelerated, and then decelerated! 7:00 a.m.

When I go back to check the X nest, 7:15, I find the ♀ incubating again. Still only one egg. She flutters silently (as she did before, earlier this morning). Flies into dense grass. There she begins to utter Chk's. Then joined by ♂. Mutual G-HAC. ♀ does not resume Chk's (although I am just as near as ever). Pair hop about in grass. More G-HAC's. Then I hear soft Wh notes. Copulation? Pair emerge from grass. ♀ quite fluffed underneath. Pair hop around together. ♀ once quivers tail, after hop, when perched right in front of ♂, her tail pointing into his face. Then ♀ starts to preen. ♂ goes to tree and sings.

Then, once, while the ♂ sang about 20 feet away, the ♀ interrupted her preening to utter one burst of soft G-HAC, "to herself."

Then the ♀ flies to join the ♂ and they both hop off into the bushes, apparently feeding, 7:30 a.m.

Observing the Chk patterns this morning, I think it is obvious that they cannot be pure escape reactions. They must contain a small component of something else.

I notice that when the birds are hopping about, more or less normally, that the yellow-caper are hidden by the gray neck feathers. In other words, when the yellow is visible it is an indication of hostility (aggression?)

I think that GHAC and Wh Notes intergrade completely — via the soft GHAC notes sometimes uttered as "greeting" GHAC probably also intergrades with HAC. The GHAC might be considered an intermediate between HAC & Wh Notes.

This would suggest that the Wh Notes must contain at least a slight element of hostility.

The "Chu" Notes of songs may be related to ordinary Chu Notes in much the same way that SSN's are related to SN's. The "Chu" is round rather like the sharp Chu Notes.

If so, the "Whit Chu" songs of this species are probably strictly homologous with some of the vocal performances of Black-capped Saltators (and probably many other species).

If a copulation did occur in the grass earlier this morning, it occurred in almost exactly the same place where I thought a copulation occurred a few days ago.

Everything very quiet now, 8:00 a.m.

Flashed x q off nest again 8:20. 2 eggs in nest now! q flashes silently, joined by ♂, both GHAC, both disappear.

The ♂ x seems to be singing less today than on previous days. Even when the q is not with him.

Y ♂ has also been relatively silent this morning. Has the Y ♂ laid eggs also?

If so, it is interesting that both these pairs (and my capture pair of Orange-billed Sparrows — see today's notes on Ammon) have laid

Memoranda, Jan 6, 1961, II

(41)

✓ eggs at almost exactly the same time.

✓ I collected the X eggs when I left at 7:00 a.m.

Memoranda, I

June 14, 1961
Frijoles

Back X-Y area 5:45 a.m. Both X and Y ♂'s singing vigorously. Lots of Acc's. Then both shut up. Absolutely nothing to see 6:05

X birds may be feeding together on RR tracks — a little down the levee. Yes! When I flush them, they separate. ♂ goes to usual favor perch to sing. ♀ perches in another bush. Utters SN's and Chk Notes, apparently as response to ♂ song (she may also be nervous about my presence — but she doesn't usually utter Chk's when the ♂ is near).

Then birds go back together to feed. Then a few minutes later (6:30) ♂ back singing. Triplets (same type as a few days ago).

Watching X birds feed for a long time. Always close together. No GHAC's as long as they feed, even when one bird becomes slightly separated (about 1 ft away) from the other and then they reform one another.

Eventually separate more widely. ♂ goes to sing in tree. ♀ remains behind and preens. Then, when she has finished preening, she continues to sit but begins to utter a lot of Chk Notes. This seems to "call in" the ♂! After a few seconds he flies to perch beside her. Both GHAC. Then start to hop about, more or less together. Not very rapidly. Possibly feeding part of the time. Silent, except for a few GHAC's. A large part of the time the ♀ is in a very fluffed posture. Lots of BF. Slight CR. Wings slightly drooped, with primaries spread a little.

Head retracted on shoulders (When the ♂ used to hop around the ♀ with CR and BF, his head was not retracted.) Apparently a form of H! Tail fanned.



CR probably never more extreme than this

Silent all the time while in this posture

Angle of body & tail somewhat variable. Sometimes more nearly horizontal than this.

Once, during this behavior, when the ♂ had become separated from the ♀, by about 3 ft., he flew straight at her. Pounce? He was hidden by grass, so I couldn't see the next incidents. But there was no mutual GHAC. And no time for copulation.

I think I have seen the ♀ X assume the "H" fluffed posture, with drooping wings, before, when she was near the ♂ (I think I do all call this posture the "H-Fluff").

Y pair feeding quite high. In tops of 20 ft. trees. GHAC's when they come together. One of them also utters GHAC when it lands by itself (at least 20 ft from its mate!).

I suddenly look up, to find ♀ X sitting in H-Fluff on stump. Starts to utter click notes (probably because she sees my movement). This brings ♂ just back from a considerable distance away. Mutual GHAC.

The ♀ definitely remained in H-Fluff Posture while she uttered the Click Notes during this incident.

Ammodramops, June 7, 1961, III

(43)

Two both X's fly away and disappear for a while
Rain in Umbato 7:15 a.m. Stopping a little 7:30

Looking at the birds. I see that their tails are almost always fanned, in all circumstances. As the fanning during some displays is probably not significant.

I think my earlier notes may be somewhat misleading in one minor respect. The "CR"s of this species are probably never more extreme than the CR with the H-Hff posture drawn above. Probably not usually so "peaked". This species does not have a "real" crest like the Orange-bellied Sparrow.

When the ♂ & ♀ X were moving around together earlier this morning, I saw one or both birds perform brief rapid vertical tail-quivering several times. Not connected with anything very interesting in particular. I think this pattern must be strictly comparable with such patterns as the "tail-bobbing" of Turdus and some Tyrannidae. A locomotory "intention movement".

Leaving, in pouring rain, 7:40 a.m.

Ammodramops, I

June 8, 1961
Frijoles

Arrived usual X-Y area 5:40. X and Y ♂'s singing.

A beautiful clear morning, after very heavy rains throughout most of yesterday.

Checked the X nest. It looks rather deserted now. No eggs in it. 5:50. X ♂ has shut up, and I can't find the birds now. Ah yes, the ♂ feeding alone in field. Then flies to stump and starts to sing again.

Now 6:00, both X's feeding together

I just saw the ♂ chase a fly or other insect, high in air, in a typical flycatching flight!!

♂ & ♀ X continue feeding long time. Every once in a while, the ♂ leaves the ♀, to go to a tree and sing. Lots of AC's. Mutual CHAC whenever he rejoins the ♀. Once the ♀ sat in H-Hill, silent, for a second or so while the ♂ sang. Once the ♀ started to collect n.m., but didn't carry it anywhere. Once the ♀ uttered CHAC when she landed by herself, after a short flight, while the ♂ sang. The X pair have a definite route, sort of a rough circle, which they usually follow when feeding on their territory.

Then ♂ & ♀ X fly to tree. Hop around together. Do vertical tail quivering almost any time they land near one another. A bird landing near the other does not always orient itself so that its tail is pointing toward its mate when it performs vertical tail quivering. (I shall call this pattern "VTQ")

Then the 2 birds begin to preen vigorously and perform other comfort activities. During their comfort activities they perform lots of vertical tail quivering, which is quite like the VTQ in form. Usually when they shake out the wings.

It seems likely, therefore, that VTQ has been derived from comfort activities. It is possible, in fact, that the VTQ, as performed after landing, is still nothing more than an int. mov. of comfort activities. I rather doubt it, however. VTQ's seem to be too closely correlated with the ♂ & ♀ moving around close together.

A bird hopping on the ground feeding by itself certainly does not perform VTQ on landing.

I think the ♀ X tends to perform much more VTQ than the ♂, but I am not sure about this.

Observations, Jun 8, 1961, III

(45)

After a while (ca. 6:45) ♂ stops preening, flies to another tree and it
acts to sing. Usual form SSN-Chu's followed by Acc's. I noticed that at
least once the "Chu" of an SSN-Chu was higher in pitch than the SSN.

Then the ♂ went to feed by himself, while the ♀ remained behind, still
preening. The ♂ uttered "song", of a sort, all the time he moved about feeding.
At first, regular alternation of SSN's & Chu's. "Whit - chu - whit -
chu - whit - chu - whit - chu - whit - chu - ..."
Notes relatively soft. "Whit - chu" is very regularly spaced. Then switched
to uttering SSN's alone, in the same rhythm. These SSN's uttered by the ♂
while feeding did not have a rattle undertone (although the SSN's of the song
he utters perched in trees still do have this undertone).

Then the ♀ joins ♂ on ground. Both feed together. Then the ♂ picks
up an enormous dead leaf, flies to tree in distance. Then I can hear a series of
click notes coming from this tree. Then the ♀ flies to this tree. Unfortunately I could
don't see the birds once they reached the tree.

The 2 birds back much later 7:20. Land together with mutual G-
HAC. ♂ carrying n.m. in bill. Drops n.m. Hops around with CR and BF, neck
stretched up. Then both birds disappear from sight again.

The ♂ certainly does a lot of singing in trees while the ♀ feeds
below him, in plain sight. He does this very frequently without making any
attempt to join the ♀ for a long time. This would indicate that his singing
has its own, independent, motivation.

I notice that the birds often do BW after GHAC. Displacement? (Act-
ually, I shouldn't be surprised if they did displacement BW in quite a lot of cir-
cumstances.) BW is certainly one of their most common movements. Not always in
immediate association with feeding.

Leaving 8:00 a.m.

Ammodramops, IJune 7, 1961
Frijoles

Back to X-Y area 5:45

X ♂ singing vigorously as usual. No sign of ♀ yet 5:55
Still c. 05.No doubt but that there is seldom or never CR during singing.
I think that there is usually some BF, however. This is what makes singing
♂'s look so round-bodied.

Still no ♀ X by 6:15. ♂ X still singing

♂ X singing
in posture common inSo back-fluffing
is probably also chara-
cteristic of the song posture
of this species(I might add that the X ♂ showed no
tendency to preen between songs in this part
area.)

♂ stopped singing 6:20. Gave to join ♀? I can't see him now.

Back again almost immediately. Still no ♀. ♂ singing again immediately.

No egg in nest 6:30. But ♂ flew away and disappears when

I check the nest. Now singing back in tree 6:33. (I think these little excu-
sions must be feeding trips. I never hear GNAC's while ♂ is away this morning.)

Memoranda, Jun 7, 1961, II

(48)

ing) ♂ singing in exactly the same posture as the one drawn on the preceding page. Then in more generally fluffed posture (like the one drawn a few days ago). 6:41. Then starts to preen and perform other compact activities. Then alternates singing & preening.

♂ X appears again, briefly, to SD, as before; then back singing again.

I think the ♀ X must have died yesterday or last night!

Then, 7:10 ♂ X flies to usual preening place of the pair (where the 2 birds did so much preening yesterday — a clump of trees which catches the sunlight comparatively early). Utters about 3 SN's, started to preen, started to sing, preened again, and then disappeared again. Leaving myself, 7:18.

Memoranda, I

June 11, 1961
Frijoles

Back in X-Y area 5:45 a.m.

Both X and Y singing as usual.

I can hear GHAC's from X area before it becomes light enough to see birds. Lots of GHAC!

No eggs in old X nest

When it gets light, I notice single bird, presumably ♀, feeding on ground, while X ♂ continues to sing in tree. This feeding bird well within X territory. The feeding bird apparently utters lots of GHAC Notes (rather soft) and click Notes by itself. Also preens from time to time to perform soliciting S, on ground, in posture common for

Ammonops, Jan 11, 1961, II.

(48)



Little or no CR

Wings not always
this high

Then the feeding bird disappears into bushes. Back a few minutes later c. 0.08. Feeds energetically. Utters soft CHAC's whenever it can. Is after a short flight. Also occasional SN's. The ♂, in tree, stops singing when this bird reappears, but does not join it on ground. Still the feeding bird stops feeding to perform soliciting ♀ as before. Still no response from ♂.

This soliciting ♀ is all either silent or accompanied by a call too weak for me to hear.

Then the feeding bird (which I shall call just plain "♀" from now on) disappears again. ♂ does not resume singing. Joined her?

♂ back singing again within a few seconds. I see him fly in to be with ♀. Hidden as grass as usual!

♀ back in a few minutes. ♂ stops singing. ♀ hops along ground, uttering CHAC's by herself each time she lands after a short flight or energetic series of hops. Then ♀ starts up tree in which ♂ has been singing. Some time, around this time, the ♂ flies off to another tree and starts to sing there. ♀ continues up old tree, finally pauses, sits, utters a lot of Chk Notes, apparently in answer to the ♂'s song. Then flies

to join ♂. 6:25 a.m.

During all this period the ♀ was moving on the ground and hopping up the tree, she frequently paused briefly to perform hurried preening movements. Also occasional VTQ.

Every once in a while, she also paused to sit briefly in H-Off Posture. (This may well be an "intention movement" of soliciting.)

Now, 6:35, ♂ & ♀ still apparently feeding together. I can't see them, and ♂ has stopped singing.

One bird, ♀?, back, feeding on ground in distance. No, it is the ♂. Back to tree, singing.

Then ♀ flies in. Lands, with GNAC's, in same tree as ♂, but not close to him. ♂ stops singing, but doesn't join her. ♀ immediately starts soliciting ♀. In posture like the soliciting posture of my captive birds (this is presumably the typical posture of birds soliciting, while perched on branch). Her bill is open. Presumably uttering WH Notes. Then ♀ flies down to ground, to feed as before. Disappears from sight. Back again 6:40. Behaving as before. GNAC's and soliciting by herself. ♂ still silent (and I can't see him - but he isn't close to the ♀). Then ♀ disappears again.

It is interesting that the ♀ never approaches the ♂ very closely while she solicits !!!

All her GNAC's by herself are the "Whoah whoah..." type. Sometimes even "Whoah-hoo-hoo..." type.

When a train comes, the ♂ flies away across the tracks. ♀ remains behind. She utters quite a lot of SN's (fairly long intervals between notes) and then flies after ♂.

♂ back singing. ♀ comes back some minutes later. Lands with

Ammonops, Jun. 11, 1961, IV

(50)

GHAC, in same tree as ♂ but some distance away. ♂ stops singing, begins to utter Chk Notes. ♀ moves on. ♂ falls silent 7:15. A few minutes later, the ♂ begins to sing again.

Everything very dull now, 7:25. Both birds disappeared.

Then ♂ back. Sings. ♀ flies in, lands on ground below tree in which ♂ is perched. ♂ stops singing immediately. ♀ utters GHAC as she lands. Then begins extreme "reluctant Q". Long sustained. ♂ flies away to another tree. ♀ stops Q, begins to feed.

It is beginning to look as if some or all of the Glysters of this morning is apparentment - not strictly sexual!!!

All gone and quiet again 7:45.

Listening to Y♂ singing in distance. Her SSN's also have rattle undertone. I think that SSN's are probably the song notes which have rattle undertones most frequently.

When watching ♀ x sitting by herself doing a lot of preening and other comfort activities. During this period of comfort activities she also utters 10 or 12 bursts of GHAC. Just as usual. Twice these bursts of GHAC appeared to be provoked by the approach of birds of other species (once a Hatched Tattler, once a Yellow-bellied Seed-eater). The ♀ Green-backed made no attempt to approach the birds of other species when she uttered these GHAC's. Just went on with her comfort activities. (In fact, these GHAC's looked almost as if they could be apparentment too.) The other bursts of GHAC's appeared to be "spontaneous" sometimes, but not always, uttered when the ♀ was "shaking out" her wings. (Is there some sort of "link" between GHAC - Wh type notes and rapid wing movements??? The shaking out movements are rather like Q in form.)

Once the ♀ interrupted her comfort activities to perform prolonged

Memoranda, June 11, 1961, I

(51)

I and high intensity Q. Apparently spontaneous. (Not observed coming in distance, I think). The ♀ uttered 7 or 8 Chk Notes immediately before the Q, and then an approximately equal number of similar notes immediately after the Q!

Dropping observations of these birds, at least temporarily, 8:30.

Memoranda, I

June 12, 1961
Angeles

Back to X area 5:40. ♂ not singing when I arrive. Then it starts a few minutes later. Begins with SN. Then repetitions, but quickly by alerts to other Acc's as well.

He then flies to ground. I can't see ♀. Bird on ground, apparently the ♂, does "selecting Q", very extreme, apparently all by itself. Then flies back to tree. Starts to sing again !!! ? !!! ? !!!

Then ♂ flies away again. Still no sign of ♀ 5:55.

♂ back singing in tree. A few minutes later, ♀ appears. Feeding on ground. ♂ stops singing. ♀ utters GHAC's by herself as yesterday. Also a few SN's and Chk Notes. Once utters GHAC's when she flies low over head 6:05.

♀ returns to clump where old nest is. She also did this a few times yesterday. Don't tell me this with the old ♀? ♂ doesn't sing when she leaves. Perhaps he never joins her.

Yes! Both back on ground in tree with mutual GHAC ♀ goes to ground to feed. ♂ remains in tree and sings.

♀ is behaving much as yesterday, except that she is doing little or no Q! Why? Is she sexually satisfied? Or is it just that

Memoranda, Jan. 17, 1961, II

(50)

she is less afraid of the ♂ now?

The ♂ also seems to be doing less singing than yesterday. Even when the ♀ is not close by.

This is certainly the same ♀ as yesterday (one primary is slightly disarranged in a destructive way).

♀ flies back to old nest area. ♂ joins her. And I lose sight of both of them - unusual.

X pair engaged in dispute with another pair, not Y, at one edge of their territory. (I shall call this new pair "M"). Mutual "redirected" GNAC by birds of both pairs.)

The X ♂ & ♀ are certainly staying together much more than yesterday. The ♂ seems to join the ♀ with little or no hesitation today.

Birds generally very dull today 6:35. X birds seem to be spending most of their time feeding together, out of sight. So far, the ♀ has shown no signs of n.b. I have heard relatively little GNAC this morning, so I don't think the X's can be doing very much of it. Now I see them feeding together. A little GNAC at first. Soft. Then silent as they continue feeding. After feeding for a while, the ♂ flies up into a tree. Sings, then starts courtship activities. A few minutes later, ♀ goes up into another tree, 40 feet away, utters 1 SN, then does courtship activities herself 6:50. Then ♂ flies away, ♀ follows.

♂ & ♀ in tree. Perching just close together. ♀ hops up toward ♂. One or both birds utter(s) GNAC. ♀ begins soliciting ♂. As before. Sitting at all, making no attempt to approach ♂ while she S's. ♂ starts to hop toward her, then flies away. ♀ stops S, does BW.

♂ & ♀ X on ground. ♂ flies to tree. ♀ stays behind. Stands in more or less extreme H-Off. Then supplants Volatuna. Then stands again in H-Off.

Ammonops, June 12, 1961, III

(53)

feeding in direction of ♂. Then ♀ is one wing. Then ♀ is extreme. Combined with more or less typical H-Hy posture. No H. Then stops. Hops away. Apparently silent throughout their performance.



Wing raised & ♀ was the wing nearest the ♂

Leaving 8:00 a.m.

Ammonops, I

June 14, 1961
Frijoles

Arrive X area 8:15 a.m. ♂ singing. ♀ shows up 8:54. ♂ stops singing. ♀ feeds. ♂ does not, I think, join her. Then ♀ flies away. Then ♂ does join ♀, where I can't see them. Then ♂ flies to tree, sings, while ♀ continues to feed. ♂'s song while ♀ is away has singing like SSN-SSN-SSN-Chu-SSN-SSN-SSN-SSN-Chu-SSN-Chu-SSN-SSN... Acc's begin when ♀ moves further away. ♀ utters a few soft GHAC notes when feeding by herself, but relatively very few. Many fewer than on previous days. I suddenly see a long, silent, aerial chase. Involving a Green-back. I don't know if they are the X birds or not.

Memoranda, Jun. 14, 1961, II

(54)

Then a pair re appear from direction in which chase disappeared.
Hop about utter with lots of G-HAC. Then feed quietly together 6:35

Then spend a long time mostly feeding quietly. ♂ usually "leading".
♀ Every once in a while, the ♂ leaves the ♀ to fly up into a tree. Usually
(not always) sings there. ♀ sometimes flies up to join ♂. He does not let
her get very close. Tends to fly and/or keep away from her. Frequently flies away
to another tree to continue singing there. 6:55

♀ and ♂ preening quietly in separate trees now 7:00

♂ occasionally utters SSN - SSN - SSN - Ch - SSN - Ch - SSN - SS

N - Ch - SSN, ... type song. This must be low intensity!



White throat very conspicuous

Then ♂ flies down to feed 7:10. ♀ remains behind in her tree. She
begins to utter Ch notes in very regular rhythm. — — — — —

I think the ♂ answers her, from ground, once or twice
with similar notes. Then ♀ shuts up, ♂ continues to feed silently.

Then ♂ flies up into ♀'s tree, uttering G-HAC's as he advances straight toward
her. ♀ begins retreating, & immediately (front now drawn above). ♂ stops
advancing. ♀ stops & flies away. ♂ follows 7:20.

♂ back a few minutes later. Singing by himself.

There is no doubt but that the ♂ does not usually have CR when he

sings

Ammodramops, Jan 14, 1961, III

(25)

White throat +
chest also con-
spicuous in this



Common song posture

Feathering is not always present, but
perhaps typical

Sometimes (of course) breast & belly
much more fluffed
Tail not spread.

Ammodramops, I

June 17, 1961
Frijoles

Arrive X area 5:45. ♀ uttering Chk Notes in shrubbery. Then
♂ starts to sing. ♀ alerts up.

♂ flies to join ♀. Both hidden by shrubs. Mutual GHAC. ♂
back in a few minutes. Jumps again. ♀ utters SN's and soft GHAC notes
after ♂ leaves. On ground 6:00 a.m.

Then ♂ joins ♀ again. Then back to perch singing again. ♀ hops
along ground, feeding. Utters quite a lot of SN's and GHAC Notes. Tends to
give SN's just before taking a long hop or flying up on a stump, and to give
GHAC's on landing after long jump or short flight.

♀ eventually hops up into tree where ♂ has been singing. ♂ stops
song. ♀ utters GHAC as she gets near ♂. ♂ immediately flies off and
nugs in another tree!

♂ + ♀ feeding together 6:20. Then ♀ starts to peck at m.m. Grad-
ually starts to wrestle with enormous strand of m.m. Utters lots of Chk Notes, +
series of "Tuk" Notes, when wrestling particularly vigorously. "Tuk"s app-
eared to be nothing but accelerated high intensity Chk's. (Although both types

Ammonops, Jun. 17, 1961, II

(56)

es of notes were quite typical). Then ♀ flies to nest site with n.m. (This is far away from the old nest). Silent as she does so. ♂ goes to tree and sings ♀ back unaided. Collecting n.m. in silent. ♂ continues to sing.

This continues for a while. Then ♂ down to feed, while ♀ remains in tree. ♂ silent, ♀ utters quite a lot of Chik Notes. 6:40 Then ♀ silent. ♂ continues to feed. Finally ♂ flies up to ♀. Mutual CHAC ♀ does soliciting. ♂ flies away! ♀ immediately starts to preen. ♂ goes back to feeding, while ♀ remains behind in tree. Both silent. ♂ finally moves out of sight. ♀ gone too 6:55.

I finally find the birds, feeding peacefully together 7:10. Pick them. ♂ back to tree, preening silently. ♀ starts collecting n.m. Again utters a burst of many Chik Notes, developing into "Tuk" Notes, when wrestling with the unmanageably large piece of n.m.

Well! Now I am baffled! Bird which had been wrestling with n.m. incident described immediately above begins to utter SSN-Chu song. Bird preening in tree answers by Chik Notes.

— Then bird which uttered SSN-Chu's also begins to utter Chik's 7:30

This means either that the ♀ can utter SSN-Chu song or that it was the ♂ wrestling with n.m. I think probably the latter (remembers his behavior when he had the other ♀!).

Then 2 birds go to nest site together. Disappear from view. Back, BW-ing furiously. Then disappear again.

♂ back singing, 7:50.

Then ♀ back, on ground, collecting n.m. ♂ flies to join her. Mutual CHAC ♀ continues collecting n.m. ♂ hops about with slight TV. Both disappear. Then I hear long bursts of "Tuk" Notes from the direction in which the birds disappeared.

Ammonops, Jun. 17, 1961, III

(57)

♂ (?) back. Utters typical GNAC's when picked & chased by pair of Variable feeders.

♀ (?) back later. Utters S or G typical Chk Notes when wrestling with large m.w.

Leaving 2:10 p.m.

Ammonops, I

June 18, 1961
Frijoles

Arrive X area 5:45 a.m. ♂ singing.

♀ arrives 5:50. ♂ stops singing. GNAC (which I can't see), ♂ back to singing again. ♀ then utters a lot of Chk Notes (from some distance away) while the ♂ continues to sing.

It would certainly appear that the ♀ uses Chk Notes to "call in" the ♂!!

The ♂ continues to sing after ♀ stop Chk's and falls silent. Largely "What-dun" type song. But some of the first notes of doublets seem to be real SN's, not SSN's. Also uttering occasional triplets.

Then ♂ flies away, disappears for long time. Presumably feeding with the ♀ 6:30

It has been noticeable, both today and yesterday, that the birds "disappear" for much longer periods than before. Both silent for long periods. I.E. displays are decreasing, now that the pair bonds are strong.

♂ back singing again 6:30. Largely SSN-Chu's. Relatively few Acc's. Although he is singing steadily, I think so many of these songs must be "incomplete" because the ♀ is nearby. (I can't see her, but I think she is building at the same site as yesterday.)

♀ flies into the nest to ♂ ♂ forms very flustered GHR. ♀ BW's ♂ does a lot of VTQ. Then both down to feed. Largely silent. Just an occasional trace of GHR. Then ♀ starts to pick at n.m. First small n.m. Then very large & long twigs and large dead leaves. At this time, I notice that she has extreme CR, and wings drooped. Wings possibly quivered a little. But this may have been due to the effect of coping with the large n.m.



Sometimes the leaves she tried to pick up were even larger than the one shown here.

♂ also starts to pick up n.m. Without CR or wing-drooping. Then flies up to tree, dropping n.m. Begins to sing again 6.45.

Both birds quite silent throughout this n.m. collecting.

Copulation! In tree, at least 30 feet off ground. Both birds had been at nest site. Then one (♀?) back, silent, just sitting. Then the other bird (♂?) back, landing in same tree as first bird, but at least 20 feet away. This second bird hops rapidly toward the first. GHR when it gets close to the first. This GHR sounded as if it were uttered by only 1 bird. Unfortunately my view was obscured by leaves. But the cop occurred just as soon as the 2 birds got together. Little or nothing in the way of preliminary display.

play except for the C-HR. The ♀ may have begun soliciting ♂ just before the ♂ mounted. She certainly continued soliciting ♂ after he mounted, before the cop really got going. Cop. apparently successful ♂ then flies straight off ♀, going at least 10 feet away, then landing on branch. ♀ continues soliciting ♂ for some seconds after ♂ flies off. Then she does lots of BW, or few other court foot activities. The ♂ also does several BW's as soon as he lands 7:15.

It is interesting that the ♂ did no bowing or pivoting with "Tuk" notes before mounting during this performance. It looks as if the pair is very well adjusted.

Both birds disappear again 7:20

♂ back in tree, 7:40. Singing. Shuts up when ♀ appears, feeding on ground below him. Hops along a branch in her general direction. Then just freezes, in semi-crouched H Posture, with extreme BF, wings not drooped. Silent. Can't see if he has CR or no. Then flies into next tree, even nearer the ♀. Hidden by leaves. ♀ eventually flies up into same tree as ♂, but does n't go near him. She sits in extreme H Off Posture. Wings drooped. Combined with a lot of VTQ's. One general shake. Utters series of Click Notes. Then hops to another perch. Continues as before. This time I noticed that her wings are Q'd, briefly, in small bursts. Movement slight. Markedly discontinuous. While wings continued to be drooped. It is possible that the wings were flicked outward briefly during each brief burst of slight Q, but they were never raised. I shall call this brief slight intermittent Q "NQ". It was quite evident that these NQ patterns were exactly the same movements that the ♀ made earlier when collecting n.m. on ground!

The ♀ continued Click Notes and H Off all the time she did NQ's. Also (probably) VTQ's. I think that the VTQ's were at least partly synchronized with NQ's; but some NQ's certainly occurred without VTQ's.

Announcements, Jun 18, 1961, IV

(60)

Then both birds fly down to ground. Feeding slightly. Then both begin to peck at n.m. ♂ suddenly flies toward ♀, carrying n.m. in bill, uttering c or 7 Chk Notes. Then reverses. Starts to hop up tree, still carrying n.m. Silent. A little bowing and pivoting. Extreme CR and BF. Then drops n.m. Release 7:50

I wonder if these "wrestling with n.m." patterns could be a "substitute" for sex, when sex can't develop properly for some reason(s)?

Now ♂ singing in one tree. ♀ preening in another. ♀ occasionally utters SN's. Also one burst GHAC 8:15.

Then both birds go feed.

Things very dull now 8:30.

♂ back singing. ♀ back, in another tree. Carrying n.m. Slight trace of HZB. Head quite horizontal, neck stretched upward more than usual in HZB posture. Wings drooped. In this posture she does Q. Real Q, continuous & extreme — although the wings are kept down throughout, not raised at all. Then stops Q, does extreme VTO. During both Q and VTO, she utters Chk Notes, still with n.m. in bill. Then flies to another tree, still carrying n.m. ♂ follows. Both land on same branch. ♂ starts to approach ♀, uttering GHAC as he does so. ♀ immediately hops n.m., begins selecting Q, in real selecting Q posture (bill straight up, neck also stretched up, relatively slight TV). Then ♂ flies away. ♀ stops selecting Q, immediately does general shake, and then BW's. 8:45.

Good heavens! The ♀ is now busily carrying n.m., repeatedly, to a site completely different from the one to which she carried n.m. earlier today and yesterday!!! Uttering Chk's and an occasional SN as she does so. ♂ singing some distance away.

This is obviously "real" n.b. The ♀ is making trip after trip, n.m.

Ammodramus, June 18, 1961, V

(21)

As more rapidly than she has ever done before.

I wonder if the ♂ picked out the earlier site, and it is only now that the ♀ has made her "own" selection ???

Now 7:00 a.m. The ♀ is silent while building. The ♂ continues to sing.

This new site is in the top of a clump of reeds, over a dead sapling. The previous site to which these birds came was in a clump of grass at least 30 ft. away. I shall call this new site "site B", and the earlier site "site A".

♂ suddenly stops singing. Utters series of "Tuk" Notes. ♀ utters Chk Notes and flies half way to him. Lands in tree. Both silent with extreme CR. Then down to ground, where ♂ already is. GHA by one or both birds. ♂ hops off (in direction site A). ♀ collects m-m, carries it to site B.

Leaving 9:15.

Ammodramus, I

June 19, 1961
Tupelo

Arrive X area 5:15 a.m. ♂ singing.
Singing posture with neck very
elongated, and swollen. This is probably
the usual high intensity posture.

Looking quite small bodied.



Amphispiza, Jan. 17, 1961, II

(62)

Still no ♀, 6:05. Is she incubating already

Now ♂ singing
in posture common to



Singing posture

♀ shows up (I can hear her) 6:10. Uttering GHAC + SN's ♂ continues to sing in tree.



CR + BF + TV
(Tail also fanned?).

♂ suddenly flies to ground. Hops in alert posture with CR, BF and slight TV. ♀ lands in nearby bush. Just sits and utters like notes. ♂ begins to feed normally. ♀ flies down to join him. Uttering GHAC as she does so. Both feed normally.

Continue to feed a long time. One or both utters an occasional GHAC and/or a series of like notes. Then ♂ flies back to tree. Sings. Then utters a series

Amurago. Jan. 17, 1965 III

(95)

ies of Chk Notes, flies to join ♀ on ground. Both GNAC. Then feed.

Then ♂ back to tree to sing. 6:23. ♀ continues feeding. Then ♀ utters SN-GNAC, flies to bush near ♀, continuing to utter GNAC as she lands. ♂ continues to sing. ♀ put legs off and starts to peck at m.m. Then flies off to site A! (I can't see if she is carrying m.m. or not while she flies, but she stays at site A a long time.) Then comes back and pecks at more m.m. (large leaves). ♂ stops singing. Joins ♀ on ground. No display. ♀ flies to site where cop. occurred yesterday. It stands. Still with leaf in bill. Then comes leaf to site A. ♂ utters Chk Notes while she is gone. ♀ answers with Chk Notes. ♂ flies to tree, begins "Whit Chu" song. ♀ continues Chk Notes. Then shuts up. ♂ continues song 6:35.

There is no doubt but that soliciting-S patterns are performed much more rarely now than during the pair-formation stage of the breeding cycle.

♂'s tail is jerked forward during all "Chu" (and Ace) notes, but not during the SSN's of song.

♀ still gone 6:40. ♂ giving only very low intensity song now. Almost all SSN's and SSN-Chu's. Soft.

♀ back 6:45. In tree. Utters Chk Notes. ♂ stops song. Utters Chk Notes too. Flies to join ♀. Mutual GNAC. Apparently no cop attempt. Both birds down to feed. ♂ back to tree. Sings. ♀ disappears. No! I can see her in another tree, preening.

Then ♂ flies to another tree. ♀ follows. Mutual GNAC as they fly, but I don't think they land together. Land from sight in leaves. Gone a long time. 6:55.

♂ back (from direction A site). Sings. Triplets. Sometimes SN-SSN-Chu SN-SSN-Chu SN-SSN-Chu Presumably from time to time.

Ammodops, Jun. 17, 1961, IV

(24)

♀ back 7:05. Runs to same tree as ♂. Utters GHAC as she lands. Then hops up toward ♂. ♂ stops singing. ♀ does constant BW-ing and VTG-ing between hops. Also 1 or 2 wing movements. Silent. Then ♂ flies away to another tree, and perches there, uttering occasional ESN Notes. Then ♀ joins ♂. Mutual GHAC. Both hop down to ground. Out of sight!

Wing and tail movements during general shakes seem to be identical with Q and VTQ (except that the wings are never raised during general shakes, as they are during collecting Q).

Things very dull 7:25

♂ back, singing 7:30. No ♀ response

Leaving myself 7:35

Ammodops, I

June 20, 1961
Kingsley

Back X area 5:45. ♂ probably singing, but not in one of his usual spots. Then shuts up. Then singing in favorite spot, 6:35. Some of his "Whit Ahu"s are really

But others are more conventional

Then ♂ flies to another tree. Crouches silently, with BF. Perches. He then flies down to ground, to join ♀. No GHAC! (Can't see birds on ground. Cop attempt?).

♀ builds at site B. Utters Chir Notes, at nest, when she has trouble

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Arremonops conirostris

From June 20,
1961

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Sometimes high in trees, 30.

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Tail-flicking. Description; 5

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Arremonops canescens

Thru Jan 20, 1961

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High Intensity Disputing. Description; 4, 19. With rail; 37. Territorial boundary disputes, descriptions; 18, 24, 25, 28, 30.

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??? "Inp" Notes Alarm?; 7. In ambivalent sexual-hostile situations; 11, 16. It is quite possible that these notes are not distinguishable from "Tuck" (TTT) Notes. See below

Chik Notes Description; 2, 3, 17, 10, 11, 27, 35, 38, 45, 42, 63, 66. With erect posture; 3. With lots of Hiding, but no CR; 31. By alarmed bird; 17. As apparent "contact" note between mated males and females; 3, 41, 42, 57, 63. With H Jff; 42. With crouch + CR + BF + double wing spreading; etc; 38. By ♂, with leaf-carrying, CR, & BF; 60. By ♀, with H Jff + NG + VTG; 59. By ♂, when close to copulatory-motivated ♀; 33. By nest-building ♀; 55. By nest-building ♂; 54. General comment; 39. Higher intensity than GHAC; 12. Not alarm (????); 3.

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Arremonops canrostris

From June 20, 1961

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H Sn. Description, 4.

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Arremonops concoloratus

Thru June 20, 1961

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Ammonops constrictus

Thru Jun 20, 1961

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Anemonops concoloratus

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Thru Jun 20, 1961

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